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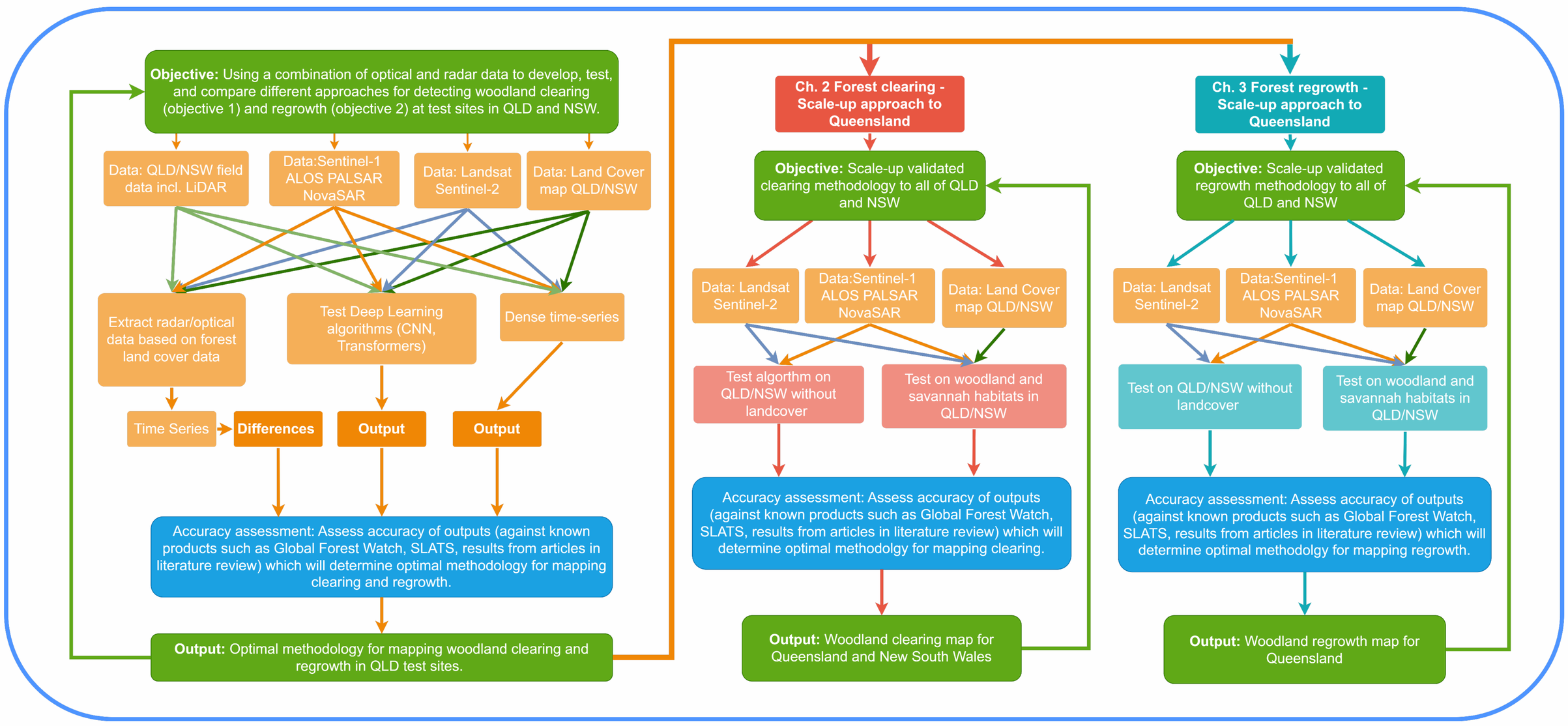
# Improving Detection of Clearing and Regrowth in Woodlands Using Satellite Imaging Radar

## Introduction

- Woody vegetation mapping and monitoring of clearing and regrowth can be improved by incorporating imaging radar
- Current methods for mapping clearing and regrowth QLD and NSW use only optical sensors
- Imaging radar (with the correct wavelength) provides sub-canopy structural information, and when combined with optical and field data, enables comprehensive measurement of vegetation structure.

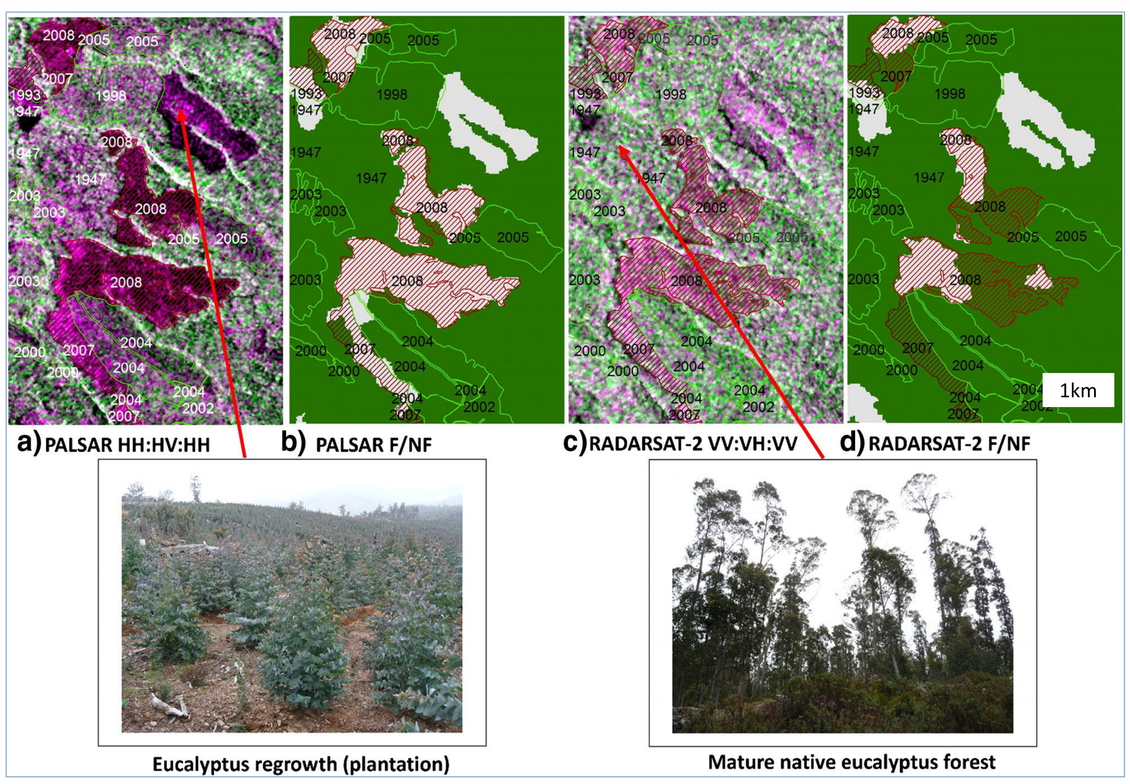
## Aims

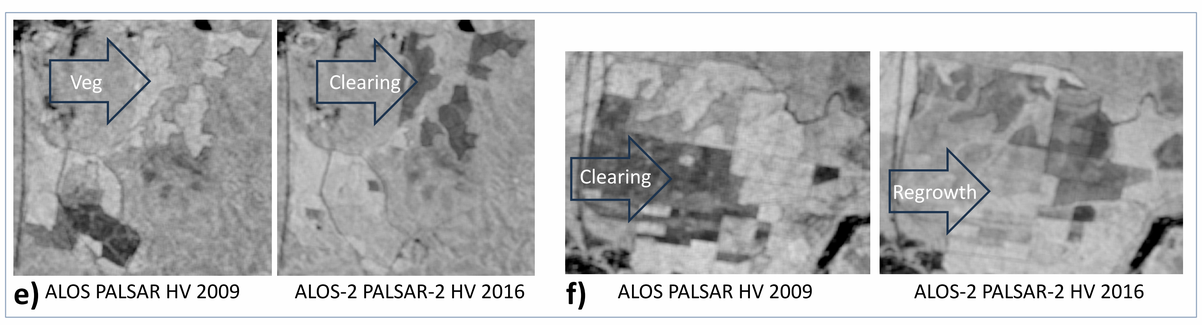
- Develop and test approaches to map clearing using imaging radar and multi-spectral data with deep learning at selected sites in QLD and NSW
- Develop and test approaches to map regrowth using imaging radar and multi-spectral data with deep learning at selected sites in QLD and NSW
- Scale-up both approaches to regional and continental scale application e.g. across Queensland and New South Wales.




## Expected Results

- Automated workflow which utilises imaging radar and optical imagery to produce monthly / annual maps of clearing and regrowth




Mitchell et al. (2014) illustrates the utility of L-band and C-band SAR in identifying structural changes. **a)** SVM classification (2-class) of area near Matthinna, Tasmania using ALOS PALSAR (L-band) and **c)** RADARSAT-2. **b)** and **d)** are forest/non-forest classification with forest polygons.

North of Grafton, NSW. **e)** and **f)** illustrate the clearing and regrowth information that can be gained by using SAR. In **e)**, the darker area in 2016 is due to more surface scattering and is likely to be clearing but could also be short vegetation due to L-bands longer wavelength and greater penetration passing through the short vegetation. C-band would work well with regrowth in open areas. Optical could help distinguish between no vegetation and short vegetation. **f)** shows what is likely to be regrowth in 2016.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## References


Mitchell, A.L., Tapley, I., Milne, A.K., Williams, M.L., Zhou, Z.-S., Lehmann, E., Caccetta, P., Lowell, K., Held, A., 2014. C- and L-band SAR interoperability: Filling the gaps in continuous forest cover mapping in Tasmania. Remote Sensing of Environment 155, 58–68.



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